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<p align="center">Division of Forensic Science</p> <p align="center">CONTROLLED SUBSTANCES TRAINING MANUAL</p>	<p align="center">Amendment Designator:</p>
	<p align="center">Effective Date: 8-December-2003</p>
<p align="center">4 INTRODUCTION TO DRUGS</p> <p>4.1 Objectives</p> <p>4.1.1 To familiarize the trainee with different classes of drugs of abuse</p> <ul style="list-style-type: none"> • Narcotics • Stimulants • Depressants • Hallucinogens • Miscellaneous prescription drugs <p>4.1.2 To familiarize the trainee with simple pharmacology of the major classes of drugs</p> <p>4.1.3 To familiarize the trainee with the molecular structures of the most commonly abused drugs</p> <p>4.1.4 To familiarize the trainee with the origin and physical form of some of the more common drugs</p> <p>4.1.5 To familiarize the trainee with the sources of information for various controlled substances</p> <p>4.1.6 To familiarize the trainee with the legal aspects of controlled substances, to include scheduling in the Code of Virginia and the Federal Drug Control Act</p> <p>4.2 Modes of Instruction</p> <p>4.2.1 Self-directed study through study questions and practical exercises</p> <p>4.3 Reference</p> <p>4.3.1 Marnell, Tim, editor. <i>Drug Identification Bible, Fourth Edition</i>. Grand Junction: Amera-Chem, Inc., 1999.</p> <p>4.3.2 Goodman Gilman, Alfred, M.D., PhD. <i>The Pharmacological Basis of Therapeutics</i>. New York: Pergamon Press. 1990.</p> <p>4.3.3 Shulgin, Alexander. <i>PIHKAL: Phenethylamines I Have Known and Loved</i>. Berkely: Transform Press, 1995.</p> <p>4.3.4 <i>Drugs of Abuse</i>, DEA Publication, 1997.</p> <p>4.3.5 <i>Code of Virginia</i>, “The Drug Control Act” (with emphasis on § 54.1-3401; § 54.1-3443 - § 54.1-3456) and §18.2-247 – §18.2-265</p> <p>4.3.6 U.S. Controlled Substances Act, Title 21, Chapter 13</p> <p>4.3.7 Ciolino, L. A. et al. “The Chemical Interconversion of GHB and GBL” Forensic Issues and Implications” <i>Journal of Forensic Sciences</i>, 2001, Vol. 46, No. 6, pp. 1315-1323.</p> <p>4.3.8 Bommrito, C. “Analytical Profile of Gamma-Hydroxybutyric Acid (GHB)” <i>Journal of the Clandestine Laboratory Investigating Chemists Association</i>, Vol. 3, No. 3, 1993.</p> <p>4.3.9 Chappell, J. S. “The Non-equilibrium Aqueous Solution Chemistry of Gamma-Hydroxybutyric Acid” <i>Journal of the Clandestine Laboratory Investigating Chemists Association</i>, Vol. 12, No. 4, 2002.</p> <p>4.3.10 Inaba, D. S. and Cohen, W. E. <i>Uppers, Downers, All Arounders</i> Ashland, OR: CNS Publications, Inc., 2000.</p>	

Division of Forensic Science**CONTROLLED SUBSTANCES TRAINING MANUAL**

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4.4 Study Questions

4.4.1 Define the following:

- Controlled substance
- Distribution
- Manufacture
- Drug
- Narcotic drug
- Marijuana
- Cocaine base
- Hashish and hashish oil
- Anabolic steroid
- Depressant
- Stimulant
- Alkaloid

4.4.2 Match the following drugs with their classification and scheduling:

Classifications: AS—Anabolic steroid; D—Depressant; H—Hallucinogen; N—Narcotic/Opiate;
S—Stimulant

Drug	Classification	Scheduling
3,4-MDMA		
PCP		
Heroin		
Hydromorphone		
Psilocyn		
Methadone		
Pentobarbital		
Salicylamide		
Codeine		
Nandrolone Decanoate		
Methamphetamine		
Caffeine		
Diazepam		
Cocaine HCl		
Dextropropoxyphene		
Meperidine		
Phentermine		
Chlordiazepoxide		
DMT		
Oxycodone		
Methylphenidate		
GBL		
Trenbolone implants		
LAMPA		
Ethanol		
Benzocaine		

4.4.3 List the physiological effects of the following:

- Designer drug

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<div> <ul style="list-style-type: none"> • Depressant • LSD • Anabolic steroids • Phenethylamines • Morphine • Analgesics <p>4.4.4 List the pharmacological actions of the following drug classes:</p> <ul style="list-style-type: none"> • Depressants • Hallucinogens • Narcotics • Stimulants <p>4.4.5 Depressants</p> <p>4.4.5.1 What is the difference between a sedative and a hypnotic?</p> <p>4.4.5.2 What is the largest drug group within the depressants?</p> <p>4.4.5.3 How are barbiturates classified?</p> <p>4.4.5.4 Draw the general structure of a barbiturate.</p> <p>4.4.5.5 How are most depressants illegally obtained?</p> <p>4.4.5.6 Why are the benzodiazepines included with the depressants? Give their general structure.</p> <p>4.4.5.7 What is chloral hydrate and how is it used?</p> <p>4.4.5.8 What does synergism mean?</p> <p>4.4.5.9 Explain the relationship between GHB, GBL and 1,4-butanediol.</p> <p>4.4.5.10 Describe the equilibrium formed between GHB and GBL in aqueous solutions of various pH values. How does this effect the analysis?</p> <p>4.4.6 Hallucinogens</p> <p>4.4.6.1 What medicinal use do hallucinogens have?</p> <p>4.4.6.2 From what is LSD derived?</p> <p>4.4.6.3 What is the chemical name for LSD?</p> <p>4.4.6.4 What is peyote? Is it controlled?</p> <p>4.4.6.5 What is the scientific name for “magic” mushrooms?</p> <p>4.4.6.6 What is the chemical name for MDA? For MDMA? For MDM?</p> <p>4.4.6.7 What is the chemical name for PCP? How are the letters of PCP derived from the chemical name?</p> <p>4.4.6.8 Describe a synthetic route for the clandestine manufacture of PCP.</p> </div>	

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<p>4.4.6.9 What is the legal use of PCP?</p> <p>4.4.6.10 What are the chemical names for DMT and STP?</p> <p>4.4.6.11 What is the structural similarity between STP and MDA?</p> <p>4.4.7 Narcotics</p> <p>4.4.7.1 Define a narcotic according to the Code of Virginia.</p> <p>4.4.7.2 From what plant is opium obtained? How? Where is the major crop grown?</p> <p>4.4.7.3 What is the definition of an opiate?</p> <p>4.4.7.4 What are the classifications of opium alkaloids and how do they differ?</p> <p>4.4.7.5 What percentage (by weight) of opium are alkaloids?</p> <p>4.4.7.6 How many alkaloids are there in opium and which is the principal constituent?</p> <p>4.4.7.7 Name the principal narcotic drugs.</p> <p>4.4.7.8 What is the chemical name for heroin? Street names?</p> <p>4.4.7.9 Define and give examples of each:</p> <ul style="list-style-type: none"> • Natural opiate • Synthetic narcotic • Semi-synthetic narcotic <p>4.4.7.10 How are narcotics used or administered?</p> <p>4.4.8 Stimulants</p> <p>4.4.8.1 What are the two most common stimulants?</p> <p>4.4.8.2 Draw the structure of phenethylamine.</p> <p>4.4.8.3 What are the major uses for amphetamines?</p> <p>4.4.8.4 How is the word “amphetamine” derived?</p> <p>4.4.8.5 Name some amphetamine-related stimulants.</p> <p>4.4.8.6 Describe three different synthesis methods for methamphetamine.</p> <p>4.4.8.7 What is an anorectic drug?</p> <p>4.4.8.8 What are some street names for some commonly encountered stimulants?</p> <p>4.4.8.9 When is cocaine classified as a stimulant? As a narcotic?</p> <p>4.4.8.10 From what plant is cocaine obtained from? Where is the major crop grown?</p>	

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<p>4.4.8.11 How is cocaine base produced from cocaine hydrochloride? How does “crack” differ from “freebase”?</p> <p>4.4.8.12 How are various stimulants used or administered?</p> <p>4.4.9 Miscellaneous</p> <p>4.4.9.1 What is physical dependence and how does it vary from psychological dependence?</p> <p>4.4.9.2 What is meant by tolerance?</p> <p>4.4.9.3 What are some common household items with a high potential for abuse?</p> <p>4.4.9.4 Define the following drug actions:</p> <ul style="list-style-type: none"> • analgesic • antipyretic • antitussive • tranquilizer • anticholinergic • vasoconstrictor • antihelmintic • diuretic • bronchodilator • antibiotic • vitamin • anaesthetic <p>4.4.9.5 What is the difference between an antidepressant and a stimulant?</p> <p>4.4.9.6 Name four common tricyclic antidepressants.</p> <p>4.4.9.7 What is the difference between an anabolic steroid and a corticosteroid?</p> <p>4.4.10 Define the schedules in the Commonwealth of Virginia and criteria for placing a drug in each.</p> <p>4.4.11 Describe the following terms as if you were addressing a lay audience or jury panel:</p> <ul style="list-style-type: none"> • Stimulant • Anesthetic • Antibiotic • Hallucinogen • Designer drug 	
<p>4.5 Practical Exercise</p>	
<p>4.5.1 Using the form in Appendix A, start a “Drug Known” notebook by using one sheet for each drug. It is most helpful to do the tests by drug group so that differences in chemical structure can be correlated to different test results. Fill out the drug name, schedule information, pharmacological information and structure.</p>	
<p>4.6 Modes of Evaluation</p>	
<p>4.6.1 Written Examination</p>	
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